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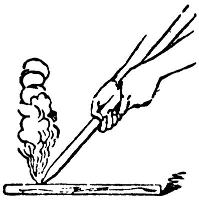
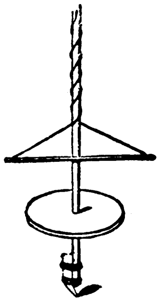
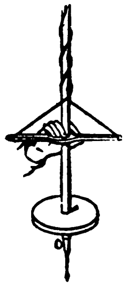


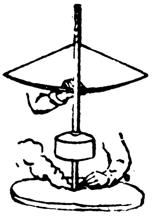
Fire-Making—Sandwich Island Plan



South-Sea Pump-Drill



Fire-Making—Swiss Pump-Drill

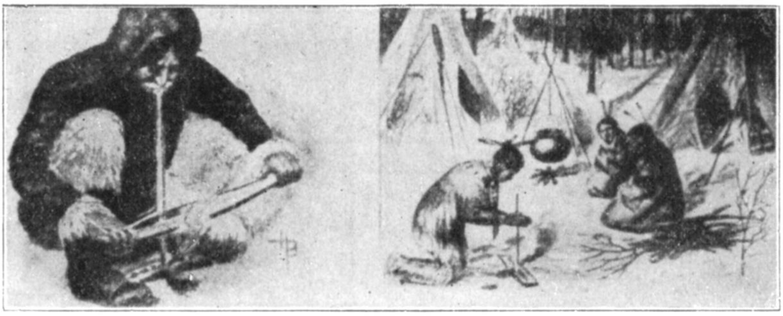


Fire-Making—Iroquois Method

A SERIES OF EXERCISES ON ILLUMINATION

HENRY T. MORTENSEN AND PEARL B. CARLEY

The following reports show how a topic of broad interest, developed in its various aspects throughout the School, furnishes material for morning exercises, and how the value of these exercises is greatly enhanced by the fact that practically the whole School has had experience with some phase of the subject. The knowledge of the experiences of the other grades stimulates each group, giving an exercise, to thoroughness in the presentation of their contribution to the School.

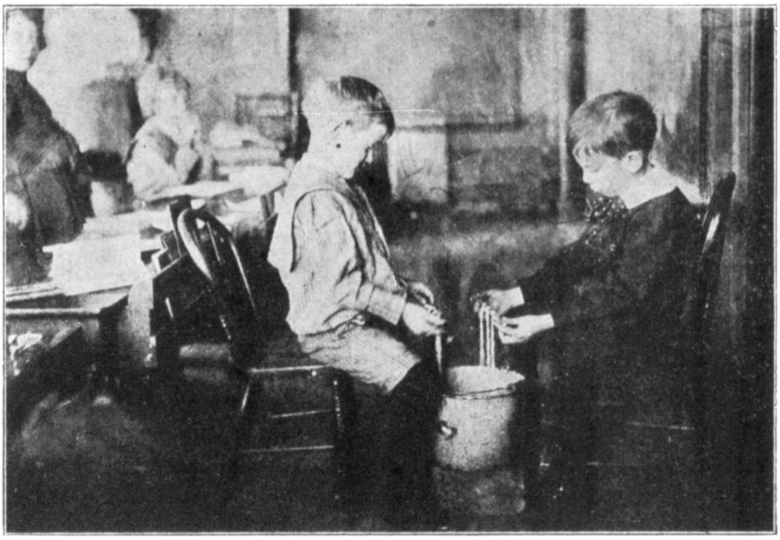


Eskimo and Indians Making Fire

The subject of fires and illumination is begun in the first grade. The children in their study of Indian life try to make fire in many ways, and they rediscover some of the methods used by primitive people. The accompanying group of pictures shows processes which the children explained with models at a morning exercise given after a series of such class-room experiments.

Another time, the first grade told at a morning exercise how they had made dipped candles as shown in the illustration.

The children also described the candles and candlesticks which they had made for Christmas gifts. The candles were molded of paraffin, colored to match the glaze of the pottery candlesticks.



Dipping Christmas Candles

The third grade have given exercises about illumination which grew out of their study of early Chicago. The children study the lives of the settlers as intimately as possible, and prominent in this study are problems of cooking, heating and lighting.

With a background furnished by a review of their first grade work,[1] and the children's imagination, the class traces the development of methods of illumination to the modern kerosene lamp, gas, and electricity, and the use of the two latter for city lighting. Different phases of the work are emphasized in successive years, and the morning exercises which are outgrowths of the work show this very clearly. One year, considerable time had been spent on the earliest methods of lighting by bonfires and the later stages of candle-making. At the morning exercise, the pupils explained the various kinds of wood they had tried for bonfires, and their conclusions as to which were the most desirable as lightgivers. They also showed candles made of five different materials, and told the results of tests which they had made to find out which gave the most light, which burned steadiest, which lasted longest, and which smoked least.

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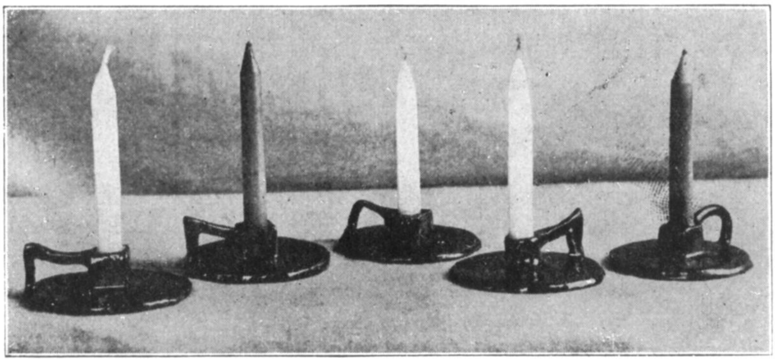
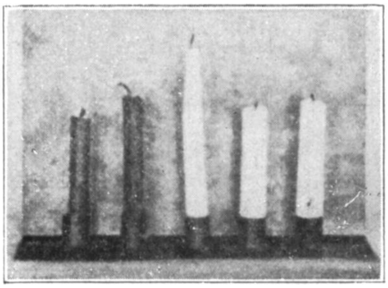
[1] In this review the Parker School Leaflets about the history of lighting were used.



Candles and Candlesticks Made by Children

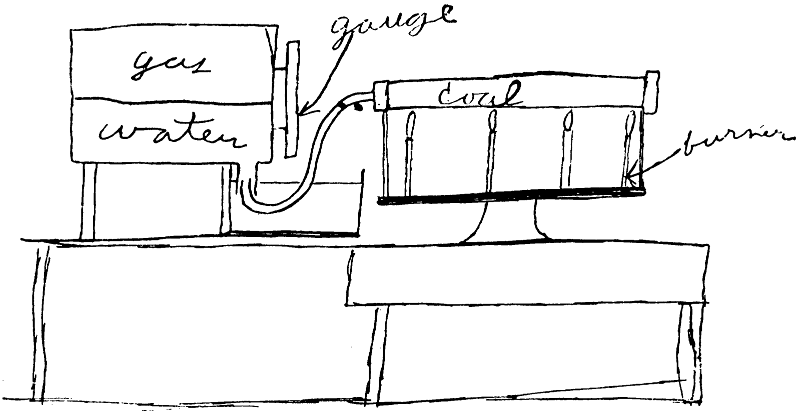
Another year, while working with candles, the third grade showed the numerous kinds of molds with which they had experimented, such as bottles, cylinders of tin or cardboard, and plaster-of-Paris molds.



Testing Candles Made of Different Materials

The study of the problem of lighting the streets and buildings of the city led to the making of coal gas in clay pipes and burning it, and afterwards to the filling of a large reservoir with gas, by the apparatus shown in this picture.

To illustrate the process of gas storage after its manufacture, and the piping of gas to the buildings of the city, the filled reservoir was brought to the morning exercise, and its contents were burned at the end of a long tube, to which a gas-burner had been attached.



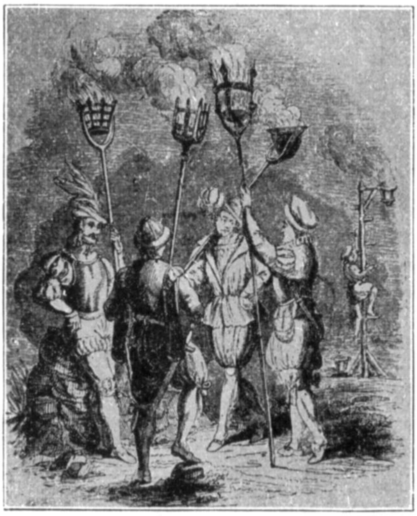
Drawing Made by a Pupil of the Grade

During those years, when members of the third grade brought numerous old-fashioned lamps to the School for study, much attention was given to them. The morning exercise which follows was given in such a year. Most of the pictures in the following pages show lamps loaned for examination. The others are copies of illustrations found in old magazines and elsewhere.

For this exercise the room was darkened, and on the stage were all the lamps the grade had. All that could be so used were lighted. Slides were thrown on the screen, and the children described them as shown in the following stenographic report of the exercise:

LAMPS

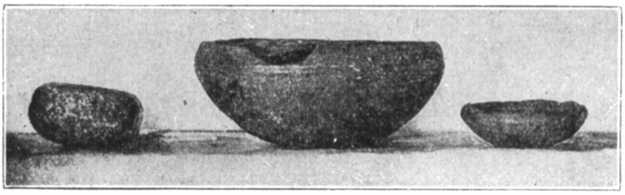
Teacher. The third grade is going to tell you this morning something of the history of lighting—something of the history of lamps. We are not going to tell you the complete history, starting at the earliest stages, and going on up, but by using such examples as we have, we shall try to illustrate some of the facts that we know about lamps. The lamps that we have attempted to light show some of the defects of early methods, namely, that they were hard to start, and that after they were started, they needed a good deal of attention.



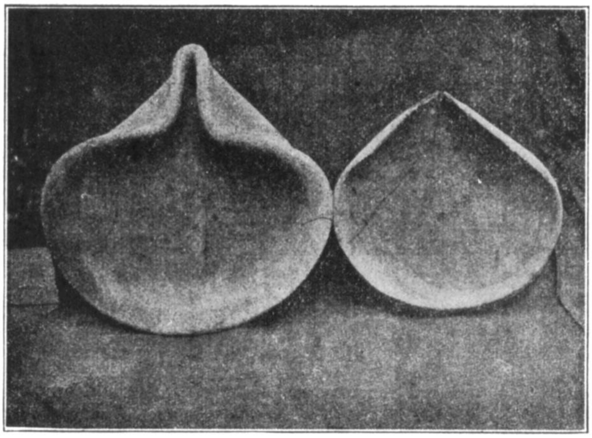
Torch-Bearers

Joseph. Many years ago they did not have enough lamp-posts to light the streets sufficiently, so people wishing to go out at night, hired these torch-bearers to escort them to the place they wanted to go and then call for them again. These torches they did not like very much, because they gave so much smoke. The lamp-posts they had were like these. It was the night-watchman's duty to look after the lamp-posts. He had a pail filled with pitch-pine knots. If the lamp was empty, he put some in. Some of the torches were made so that the pot for the knots would stand upright, when the torch was lowered.

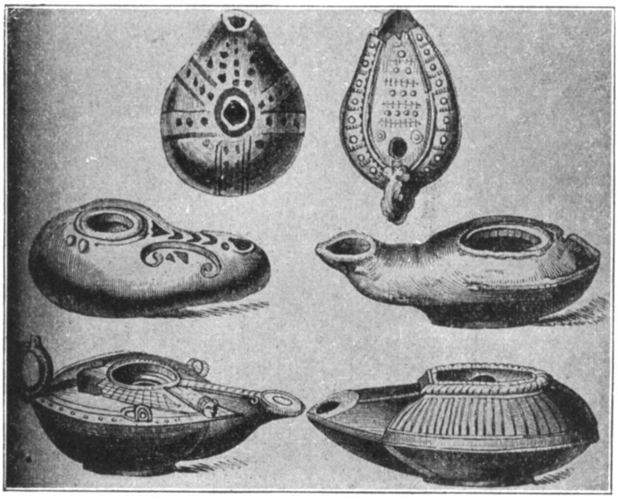
Marcia. These lamps are Eskimo lamps. This one is made of soapstone hollowed out, and is called a sledge-lamp. The other two lamps are made of hard-baked clay. The large one had a nick in one side in which the wick may lie. I can't tell whether the other one has a nick for the wick, but this looks as if it were one. These two lamps are made of clay. They are very old-fashioned lamps. The edges of this one are turned up to make a place in which the wick may lie, and this one is turned up a very little on the edge for the wick.



Eskimo Lamps



Old-Fashioned Clay Lamps

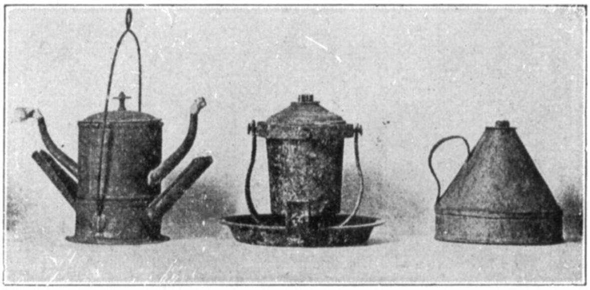


Egyptian Lamps

These are Egyptian lamps. They are all about the same. They poured the oil in here, and the wick lies there. These two have handles.

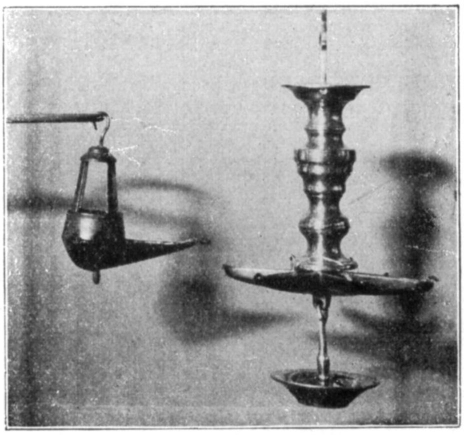
Edmund.[1] This woman is making tallow candles, and this pot is full of melted tallow. She takes a stick and ties strings onto it about ten inches long, six of them, and about four inches apart, and then she dips them down several times until there is enough tallow on the strings to make good candles.

These are some molds that are used in making candles. A string tied to the middle of a nail is dropped into the mold and through a hole in the bottom. A knot is tied tightly against the bottom so as to keep the string taut. Then they pour the tallow in around the string and let it stay until it hardens, and then take out the candles and use them. This mold is a great deal like the one I just showed you, only it makes more candles. These candles were made in this mold by the third grade last year.



Various Kinds of Lamps

Carter. These lamps are old fashioned. This one has two arms sticking up there, and the wicks go through them into the oil place here. They take the cover off and put the oil in the top. The oil that drips from the wick drops down into this trough and then goes back into here. This lamp has two arms or posts that are fastened on a ring. There is a little round button here, and one like it on the other side, that fastens onto the oil tank, so that it can swing either way, but it won't tip over. This is a little cap with two tubes sticking up through it, and the wicks go down into the oil tank. You can unscrew it. It soaks up twice as much oil and gives three times as much light as one wick would. On this you don't unscrew the cap, but put the oil in through a little place there. You can lower and raise the wicks of this one by this little tube.



Russian Sabbath Lamp

In this lamp they had a single wick, and when they wanted to put the light out, they put this cap over it and put it out.

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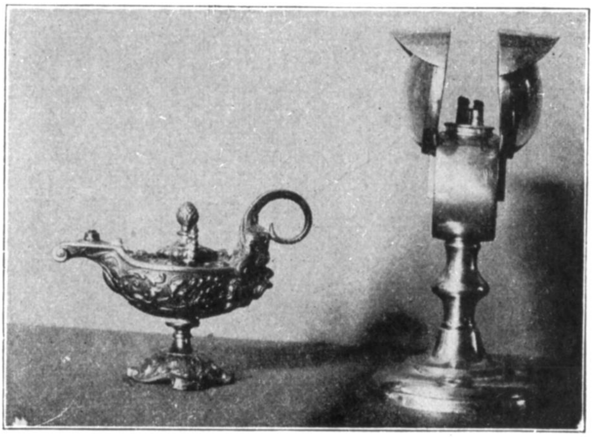
[1] This speaker referred to a picture of which we have not a copy.

Baxter. This lamp is a Russian Sabbath lamp. They put the oil in the tube here, and it goes out into these six troughs. If the oil drops, it goes along a little groove into this little pan.

This lamp (*exhibiting lamp*) was used in New England about three hundred years ago. You can open this and put the oil in, and then it will snap back. There is a little place in it to hold the wick. This lamp can be stuck into a crack of a log cabin, or hung up that way. In this lamp you open this place here and put the oil in, and the wick goes up through this small hole. This little wick is in the oil all the time, so that if you want to light something else, you can take that out and light it and put it back.

Question (from the audience). When was that lamp used?



Other Curious Lamps

Teacher. That appears to be a copy rather than an original. We think it is a copy of an old Roman lamp, but we are not sure.

Olga. This is a bull's-eye lamp. It has two tubes where the wicks go up. The magnifying glasses are to make the light brighter, and it gives more light on account of the magnifying glasses. These tops on the magnifying glasses are to make the light shine on your paper or whatever you are doing. This top unscrews, and you put the oil in here. These are cigar lighters but they are made in the shape of old-fashioned lamps.

Question (from the audience). Who used the bull's-eye lamp?

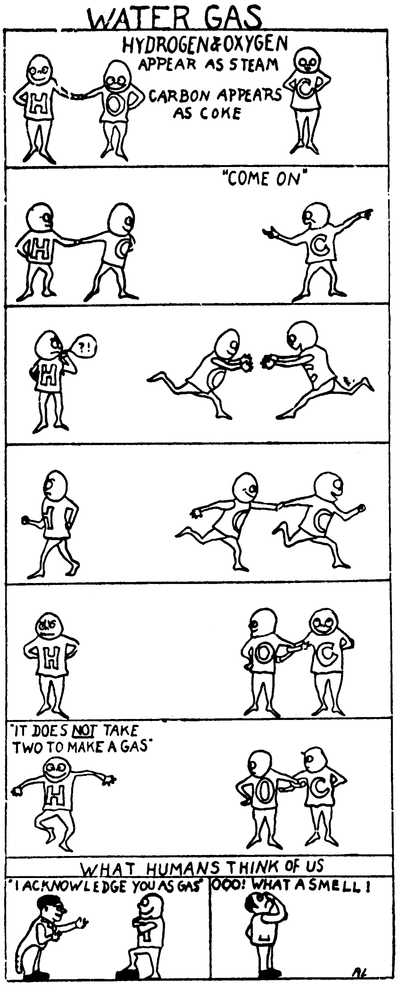
Teacher. It was used in the United States Senate by Carter's great uncle.

George. This is a sailor's lamp, and has its tank swung from arms on two posts, so that it cannot tip over. There is one nice thing about it, you can turn up the wick by this screw. A good many of the old-fashioned lamps did not have screws to turn up the wick. This tall lamp is a reading-lamp. It also has a screw to turn up the wick. The sailor's lamp has a flat wick which gives more light than the round one.

Thornton. This is a reading-lamp, and it has little caps, and when they stop reading, they put these little caps over the lights and put them out. It is made of pewter. Pewter is made of tin and lead melted together. This thing is called a snuffer and is used to put the light out. These were called camphine-lamps because they burned camphine. This lamp is to use in a barn. When a man wanted to go out and harness his horse at night, he would take this with him and jab it into the wall, or when they had guests in the house, they put it on the wall so as to have light on the porch.

Question (from the audience). What is camphine?

Teacher. Camphine is a product of turpentine. It is a highly explosive material; and I presume the arrangement of the tubes, far apart instead of close together as in other lamps, has something to do with the character of the oil being burned in it.


WATER GAS
HYDROGEN & OXYGEN APPEAR AS STEAM
CARBON APPEARS AS COKE
H
O
C
"COME ON"
?!
"IT DOES NOT TAKE TWO TO MAKE A GAS"
WHAT HUMANS THINK OF US
"I ACKNOWLEDGE YOU AS GAS"
OOO! WHAT A SMELL!
AL

Cartoon Drawn by Boy

Question (from the audience). How long ago was it that the bull's-eye lamps were used in the United States Senate?

Teacher. In 1825.

Mr. Zalinko.[1] In Russia they had an old style of lighting country-houses. It consisted of a little piece of wood. This was put in some oil, and they lighted this little piece of wood, and when it was burned out, they changed it and took a new one. There was always a little girl or boy sitting close to this old style of lamp and changing these little bits of wood. During the long winter evenings the little boys and girls of the family used to help with these lamps, changing them all the time.

Teacher. It is interesting to know how the man who wrote Webster's dictionary worked. He had two lamps something like this, except that there was no arrangement for raising the wicks. At the beginning of the evening, he had these lamps filled, and when they had both burned out, he considered that he had finished an evening's work.

Volunteer contribution (from audience). It is said that in South America there are very large fireflies, which the natives catch and place in cages made of bamboo. These cages are used as lanterns.

Question (from the audience). Why is a flat wick considered better than a round wick?

Teacher. There is more chance for the air to reach the surface of the wick, and therefore it gives a better light.

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[1] Mr. Zalinko, of Moscow, was a guest of the School on the day this exercise was given, and made this contribution.

Co-operation between the grades in this study has been possible through the medium of the morning exercise. For example, the third grade, while studying modern methods of illumination, asked the high-school class in physics to give an exercise on electricity, a subject too difficult for experimentation in the third grade.

The process of manufacturing illuminating gas is a part of the chemistry course, and the high-school class studying this subject presented exercises to show laboratory and factory methods of manufacture, and to explain the chemical processes involved. That an exercise of this sort made its point, in one instance at least, is attested by the accompanying cartoon drawn for the school magazine by one of the seventh-grade boys.

This brief outline will serve to show how the work on one topic furnishes much material for exercises. It also shows that the grade presenting any one aspect of a subject has a background of experience gained through other morning exercises on the general subject, and that nearly every one in the audience likewise has a fund of first-hand knowledge that insures his interested participation.

Reading Lamp